Wildlife Diversity Section Annual Report

September 2003 - August 2004

Division of Fish and Wildlife
Indiana Department of Natural Resources

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On the cover: A state-endangered lake sturgeon. Lake sturgeons are bottom feeders. Learn more about them on page 21.

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Birds
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Mammals
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Message from the Chief

These are exciting times in wildlife conservation, a bona fide historic turning point. Currently, all 50 states, five U.S. territories and the District of Columbia are well into the development of their Comprehensive Wildlife Strategy (CWS). You can be a part of this transition to the future of fish and wildlife management.

So, what is a CWS? Well, as a condition of federal funding, Congress has required each state to develop a report card on the status and distribution of their wildlife. More than just grades, these reports are to include a discussion of the threats to wildlife and wildlife habitat and to identify conservation actions that address these threats. Congress mandated that each strategy facilitate future coordination of conservation efforts and promote partnerships by developing the strategy with broad public input (see page 8 for CWS required elements). In order to remain eligible for federal matching funds, under the State Wildlife Grant Program, states and territories are required to submit an acceptable CWS to the U.S. Fish and Wildlife Service by October 2005.

In August 2004, representatives from 47 states were able to attend the CWS One-Year-Out Conference in Nebraska. From that meeting, we know each state is taking a slightly different approach. Although all the states are bound by the same required elements, the elements are sufficiently flexible to allow each state to tailor their strategy to their unique circumstances.

As the nation's fish and wildlife agencies travel this new road, all are challenged to widen the focus of wildlife conservation, to include more species, to develop new constituents, to involve more partners and to emphasize balanced conservation objectives and strategies. Many of those working on these strategies have come to realize that the journey is likely to provide as many conservation benefits as the destination.

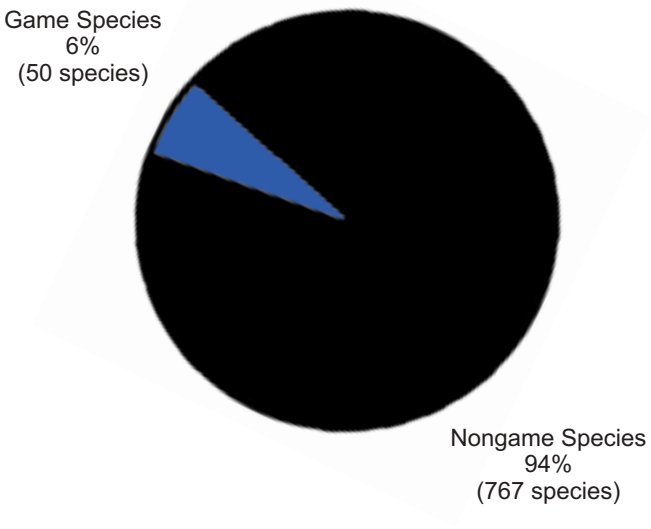
In Indiana, our journey is well underway. Species experts have been asked to complete an intensive questionnaire on species within their specialty. These surveys cover the status and distribution of selected wildlife species, threats to populations and habitats and monitoring methods and research needs for both species and their habitats. We are contacting conservation organizations, major public landholding entities, and other governmental agencies regarding their conservation priorities and concerns.

Tell us what you think! All citizens are cordially invited to follow the development of the Indiana CWS and provide comments and suggestions. Details on participation opportunities and methods can be found on the website listed below. Please join in the development of Indiana's historic conservation guide. www.djcase.com/incws

Katie Smith

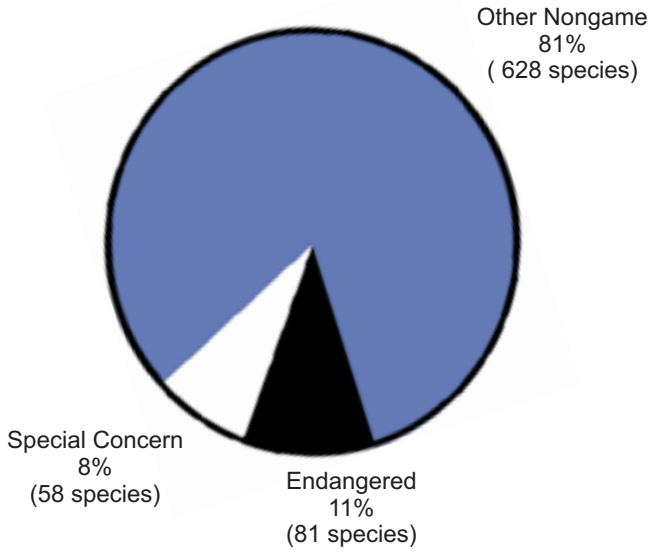
The Wildlife Diversity Section (WDS)

Indiana's Wildlife



Indiana's WDS functions on an annual budget of approximately $1,200,000 to manage 94 percent of the wildlife population. Programs related to game species function on nearly $20,000,000.

Indiana's Nongame Wildlife



A total of 139 animal species are currently the focus of the WDS. These species are either classified as special concern or endangered in the state.

Formerly called the Nongame and Endangered Wildlife Program (NEWP), the Wildlife Diversity Section (WDS) was formally promoted to a section in summer 2003. The Division of Fish and Wildlife now has the Fisheries, Wildlife, Operations and Wildlife Diversity sections to manage Hoosier wildlife.

Since the promotion, the WDS has been making huge strides in protecting and conserving Hoosier habitat and species for the future. The main goal of the WDS is to protect and manage more than 750 species of nongame and endangered wildlife in Indiana.

There are approximately 817 different animal species that can be found in the state. Nearly 94 percent of all species are considered to be nongame.

Of the approximate 767 nongame species in Indiana, 81 of these are state endangered. A total of 19 of these species are on the federal Endangered Species List and receive federal protection.

The WDS is funded almost entirely by the Indiana Nongame Fund and federal grants. Nongame fund monies are secured through private and corporate contributions.

In 1982, state legislation initiated the Indiana Nongame Fund. The income tax checkoff on Indiana income tax forms provides taxpayers the opportunity to make a tax-deductible contribution to the Fund. Taxpayers may donate all or a portion of their tax refund to help support the projects of the WDS.

Nongame . . .

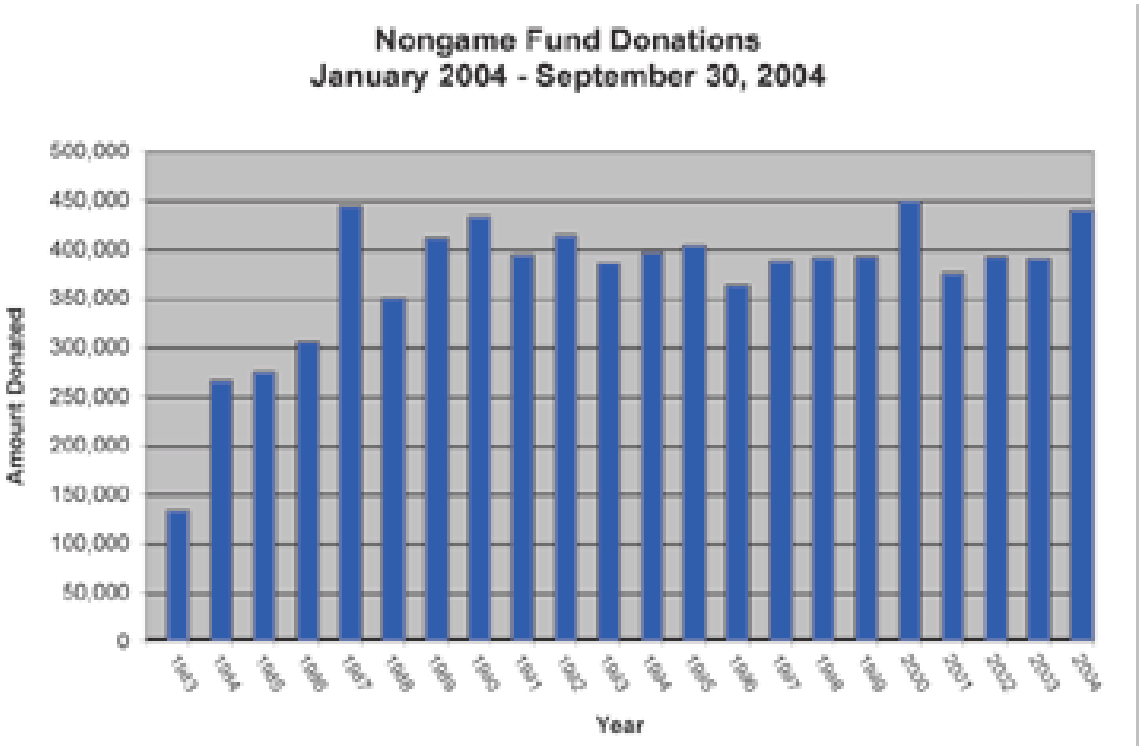
"any animal species that is not traditionally pursued for recreational, commercial or consumption purposes."

Funding the projects of the WDS

Annual Contributions to the Indiana Nongame Fund

Year	Amount Contributed
1983	$133,000
1984	$265,000
1985	$275,000
1986	$304,108
1987	$443,427
1988	$349,847
1989	$411,112
1990	$433,247
1991	$394,421
1992	$413,484
1993	$384,894
1994	$396,387
1995	$403,033
1996	$362,909
1997	$388,209
1998	$391,300
1999	$392,300
2000	$449,000
2001	$375,000
2002	$392,400
2003	$390,561
2004*	$439,171

*Amount contributed from Jan. 1, 2004 to Sept. 30, 2004.



Funding for the Wildlife Diversity Section is obtained through the Indiana Nongame Fund. The WDS and Nongame Fund receive no allocation from state revenues. It is up to the WDS to seek out partners, contributors and grants to help fund its projects.

The WDS would like to thank all individuals and organizations who have contributed staff, time or financially to support its efforts.

Although a portion of funding is currently received from the federal Wildlife Conservation and Restoration Program and State Wildlife Grants, Indiana must provide the funding up-front for these projects. Once the projects are completed, evaluated and approved, they are then eligible to receive up to a 75 percent reimbursement.

It is through these grants that the WDS has been able to bring the citizens of Indiana the latest exciting projects.

All current contributions to the Nongame Fund are eligible to be matched by federal programs. For every dollar donated, the WDS could receive up to 75 cents from these programs.

Implementation-related projects are eligible for reimbursement of 50 cents for every dollar while planning-related projects are eligible for 75 cents for every dollar.

Funding is used to provide continued support for WDS projects, land acquisition, habitat restoration, contract research projects and staff.

From Jan. 1, 2003 to Sept. 30, 2004, the Indiana Nongame Fund raised $439,171 through direct donations and donations made on the Indiana income tax checkoff.

TOP News for 03-04

(left) A northeast Indiana hidden treasure. Pisgah Marsh Boardwalk is ADA-accessible and is an excellent site for wildlife watching.

(below) Collection of eastern box turtles from the wild in Indiana is now illegal.

Inside:

INDIANA COMPREHENSIVE WILDLIFE STRATEGY

WE'RE PLANNING TO KEEP INDIANA'S WILDLIFE

Planning for the future has never been an easy task, especially when dealing with dynamic wildlife and natural resources. However, the U.S. Congress is requiring every state and U.S. territory to do just that. The development of a comprehensive wildlife strategy was mandated by the U.S. Congress in Title IX of the Commerce, Justice, State Appropriations Act for FY01. All strategies must be finished by October 2005.

These strategies will provide the foundation for the future of wildlife conservation and a stimulus to engage state and federal agencies and conservation partners to strategically think about their roles in prioritizing conservation efforts. The strategy must identify and be focused on the "species in greatest need of conservation," yet address the "full array of wildlife" and wildlife-related issues.

The Division of Fish and Wildlife is working closely with several species specialists and conservation-communication specialists to develop and implement Indiana's Comprehensive Wildlife Strategy.

Indiana plans to:

1. seek input from Indiana's wildlife experts and conservation partners

2. develop a synthesis of regional and national wildlife plans such as the National Bobwhite Conservation Initiative and Partners in Amphibian and Reptile Conservation

3. publish a comprehensive book on the history and current status of Indiana's habitats what will include GIS maps and narratives on current and historic conditions

4. use the CWS as an umbrella for strategic planning that can guide decisions and projects for the Division of Fish and Wildlife

Keep up-to-date with Indiana's latest progress online at: www.djcase.com/incws

Requirements of the CWS:

1. Information on the distribution and abundance of species of wildlife, including low and declining populations as the State fish and wildlife agency deems appropriate, that are indicative of the diversity and health of the State's wildlife; and

2. descriptions of the locations and relative condition of key habitats and community types essential to conservation of species identified in (1); and

3. descriptions of problems which may adversely affect species identified in (1) or their habitats, and priority research and survey efforts needed to identify factors which may assist in restoration and more effective conservation of these species and habitats; and

4. descriptions of conservation actions determined to be necessary to conserve the identified species and habitats and priorities for implementing such actions; and

5. proposed plans for monitoring species identified in (1) and their habitats, for monitoring the effectiveness of the conservation actions proposed in (4), and for adapting these conservation actions to respond appropriately to new information or changing conditions; and

6. descriptions of procedures to review the State Comprehensive Wildlife Conservation Strategy at intervals not to exceed ten years; and

7. plans for coordinating, to the extent feasible, the development, implementation, review and revision of the Strategy with federal, state, and local agencies and Indiana tribes that manage significant land and water areas within the State or administer programs that significantly affect the conservation of identified species and habitats,

8. Congress has affirmed through this legislation, that broad public participation is an essential element of developing and implementing these Strategies, the projects that are carried out while these Strategies are developed, and the species in greatest need of conservation that Congress has indicated such programs and projects are intended to emphasize.

Grand opening ceremony for Pisgah Marsh

June 25, 2004 marked an important accomplishment for the WDS and the DNR. The Division's first ADA-accessible boardwalk with interpretive signs officially opened.

The one-third mile boardwalk allows visitors to experience Pisgah Marsh, Pisgah Lake and the upland habitat without disturbing the property. Over 290 species of birds have been identified at the area as well as over 100 non-bird species.

The habitat is truly a northeast Indiana hidden treasure. Interpretive signs, educational trunks and supplemental materials have been developed to teach visitors about the dynamics of the area.

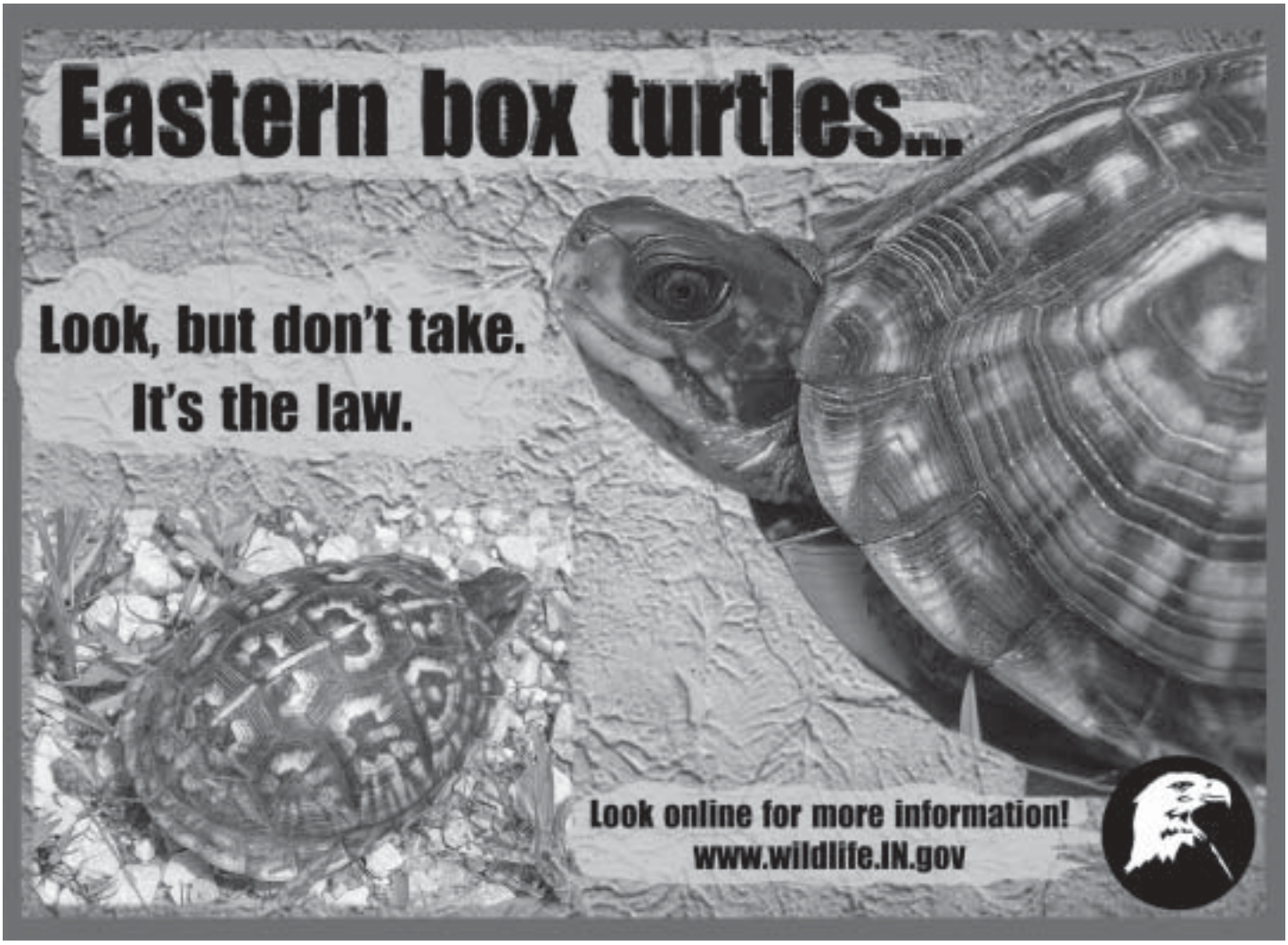
The facility is open sunrise to sunset, has restrooms, bus parking and handicapped parking available. The area is located approximately 9 miles north of Larwill, Ind., west of State Road 5. More information is available on the WDS website or by contacting the Tri-County Fish and Wildlife Area at 574-834-4461.

(above) From left, First Lady, Maggie Kernan, Danyelle Foster, Cinda Culver and Ester Rider cut the ribbon for the official opening of the Pisgah Marsh Boardwalk.

(below) The boardwalk provides plenty of shade and benches to allow visitors to enjoy the quiet atmosphere.

(top) The new Pisgah Marsh Area sign provides property regulations.

(bottom) Guests at the opening ceremony gather at the beginning of the boardwalk.



Educational posters have been developed to inform the public of the new box turtle laws.

Administrative rule changes:

State moves to protect wild box turtle populations

In 2003, hundreds of Hoosiers contributed ideas and thoughts for managing fish and wildlife resources by attending one of 19 open house meetings or by sending in written comments. The DNR proposed more than 30 rule changes to protect wildlife while addressing enforcement, legal and social concerns.

Over 800 individuals responded to the DNR's original rule proposals to voice their concern or support in October 2003. As a result, DNR staff reviewed the proposed administrative rules and made modifications to address concerns. The Natural Resources Commission preliminarily adopted the proposed rule changes during a public meeting on Jan. 20, 2004.

A public hearing was held on March 25, 2004 at which the Commission's hearing officer took public comments on the rule changes from more than 50 individuals. DNR staff

responded to public comment and as a result, made eight changes to the administrative rule proposals. The Division of Fish and Wildlife's administrative rule change proposals were presented to the Natural Resources Commission for final adoption on July 20 and all were approved except for the proposal to shorten the ruffed grouse season. Although the rules were approved by the Natural Resources Commission, they did not become law until Oct. 23, 2004 after approval by the Attorney General, Governor's Office and Secretary of State.

Box turtle conservation:

The conservation of turtles is an international conservation priority and a major conservation concern in Indiana. The combined impacts of habitat destruction and fragmentation, over-collection for pet and Asian food markets, chemical and hormonal pollution and introduced pathogens threaten the continued existence of once robust turtle populations. The changes provide for additional protection of the species and can be enforced by conservation officers.

The development of this regulation was based on scientific research and consultation with the scientific community.

Several concerns played heavily in the the final decision to prohibit the collection of box turtles.

Exportation not allowed:

Eastern box turtles are listed on Appendix 2 of CITES (Convention on International Trade in Endangered Species), with no exportation allowed at all.

Pet trade creates desire:

The pet trade is large and creates the desire for more.

Low reproductive potential:

The eastern box turtle's reproductive potential is low, with adults not reproducing until they are seven to ten-years-old (Minton 2001).

Loss of habitat:

The loss of habitat continues to be a factor for wild populations and increases the number of road-kills.

New research:

New research indicates that populations may not be able to sustain even the limited take currently allowed (Klemens 2000).

An additional study in Maryland found that box turtles recovered so slowly from natural losses such as floods and successional changes in the forest that populations of this species would respond poorly to exploitation. Eastern box turtle numbers are steadily decreasing (Minton 2001). The decreased immigration of new turtles, casual collecting, commercial collecting and loss of habitat are the major factors.

Specialized care:

Box turtles require specialized care, often beyond the skills of the average pet turtle owner. If well cared for, box turtles can live as long as 26 years in captivity. Well-cared for box turtles can outlive the childhood interest, resulting in disposal by release into the wild (Bowler 1977). It is likely that few of these released turtles survive for long. However, these released turtles still represent a source of genetic pollution and foreign pathogens to native turtle populations.

Updating rules:

The rule changes were made to help conserve box turtles and protect current wild populations of amphibians and reptiles. The new rules provide the following:

Prevents the release of reptiles and amphibians into the wild that were not taken from the wild
Restricting and/or prohibiting the release of reptiles and amphibians provides for the protection of the resource by reducing the potential for disease transmission and preserving the genetic integrity of our native populations.

Creates a new special purpose possession permit for turtles
The new special purpose possession permit provides an avenue for the possession of more than four of a native species of turtle as a means of caring for unwanted pets and non-releasable turtles. It also allows individuals to possess eastern box turtles that have been legally obtained. Individuals possessing turtles under this permit must be inspected annually, adhere to reporting requirements and permanently mark their animals.

Prohibits the selling of all species of turtles with a carapace less than 4 inches in length except for valid scientific or educational purposes
Native species of turtles already cannot be sold in Indiana, but other species are protected only by a federal (FDA) law. The

Continued

addition of prohibiting all species of turtles (with a carapace less than four inches in length) from being sold facilitates enforcement by Indiana conservation officers. The federal law was put in place for public health reasons because salmonella is easily transmitted by small turtles. Exemptions would still allow turtles under this size limit to be sold for valid scientific or educational purposes in accordance with federal law.

Nationwide research continues to reveal that eastern box turtle populations are in trouble. Indiana, like many other states, is taking proactive measures to protect and preserve these vulnerable animals before they become threatened or even endangered.

References:

Belzer, Bill. 2000. A Nine Year Study of Eastern Box Turtle Courtship with Implications for Reproductive Success and Conservation in a Translocated *Turtle and Tortoise Newsletter.*

Bowler, Kevin J. 1977. Longevity of reptiles and amphibians in North American collections as of 1 November, 1975. S.S.A.R. Herpetol. Circ., 6.

Klemens, Michael W, ed. 2000. *Turtle Conservation* Washington DC.: Smithsonian Institution Press.

Minton, Sherman. 2001. *Amphibians & Reptiles of Indiana* Indianapolis, Ind.: Indiana Academy of Science.

2005 Regulation Changes

The Division of Fish and Wildlife will begin the process to review administrative rules again in 2005, at which time public input will be solicited and individuals will have an opportunity to talk to DNR staff about possible regulation changes.

For updates on this process, sign up to receive Wildbulletin at lists.in.gov/mailman/listinfo/wildbulletin

Additional changes in nongame and endangered species regulations

Another new resident:

Adds the green treefrog to the list of native species: An active colony of green treefrogs, *Hyla cinerea*, has recently been discovered in Indiana by the Hoosier Herpetological Society and documented by the DNR. The species is common on the Kentucky side of the Ohio River in floodplain habitats from the mouth of the Green River westward. Herpetologists in both Kentucky and Illinois have noted a range expansion in this species in recent years.

Changes to the list:

Adds the common moorhen, bantam sunfish, pallid shiner, channel darter and northern brook lamprey to the list of endangered species and removes the Bewick's wren, Bachman's sparrow, bluebreast darter, spotted darter, spottail darter, Tippecanoe darter and harlequin darter. These changes were recommended by the DNR's nongame technical advisory committees.

The bird species' changes better reflect the current status of and threats to bird populations in Indiana. Two birds are being removed because they have not nested (nor occurred during the breeding season) in the State for an extended period of time. The common moorhen is being added because of a prolonged decline in populations in Indiana, the region and a continued threat to wetland habitat. The Bewick's wren and Bachman's sparrow would still be afforded protection under state and federal law.

Through extensive survey work by Brant Fisher, WDS aquatics biologist, the amount of data that has been collected on the distribution of fishes in Indiana has grown exponentially over the last decade. As a result, many fish species that are currently listed and previously thought to be very rare in the state are now known to be more common. Conversely, even with the increased sampling effort, the distribution of some species appears to have declined. It is now possible with this wealth of information to more accurately define their status in the state.

Indiana's endangered species

The wildlife species listed below are considered endangered in Indiana and are protected by state law. This list is also available online at: www.dnr.IN.gov/fishwild/endangered

(FE) = Federal Endangered
(FT) = Federal Threatened
(FC) = Candidate for Federal Listing

AMPHIBIANS

Crawfish frog	*Rana areolata*
Four-toed salamander	*Hemidactylium scutatum*
Green salamander	*Aneides aeneus*
Hellbender	*Cryptobranchus alleganiensis*
Red salamander	*Pseudotriton ruber*

BIRDS

American bittern	*Botaurus lentiginosus*
Bald eagle (FT)	*Haliaeetus leucocephalus*
Barn owl	*Tyto alba*
Black rail	*Laterallus jamaicensis*
Black tern	*Chlidonias niger*
Black-crowned night-heron	*Nycticorax nycticorax*
Common moorhen	*Gallunula chloropus*
Golden-winged warbler	*Vermivora chrysoptera*
Henslow's sparrow	*Ammodramus henslowii*
King rail	*Rallus elegans*
Kirtland's warbler (FE)	*Dendroica kirtlandii*
Least bittern	*Ixobrychus exilis*
Least tern (FE)	*Sterna antillarum*
Loggerhead shrike	*Lanius ludovicianus*
Marsh wren	*Cistothorus palustris*
Northern harrier	*Circus cyaneus*
Osprey	*Pandion haliaetus*
Peregrine falcon	*Falco peregrinus*
Piping plover (FE)	*Charadrius melodus*
Sedge wren	*Cistothorus platensis*
Short-eared owl	*Asio flammeus*
Trumpeter swan	*Cygnus buccinator*
Upland sandpiper	*Bartramia longicauda*
Virginia rail	*Rallus limicola*
Whooping crane (FE)	*Grus americana*
Yellow-crowned night-heron	*Nyctanassa violacea*
Yellow-headed blackbird	*Xanthocephalus xanthocephalus*

FISHES

Bantam sunfish	*Lepomis symmetricus*
Channel darter	*Percina copelandi*
Gilt darter	*Percina evides*
Greater redhorse	*Moxostoma valenciennesi*
Lake sturgeon	*Acipenser fulvescens*
Northern brook lamprey	*Ichthyomyzon fossor*
Northern cavefish	*Amblyopsis spelaea*
Pallid shiner	*Hybopsis amnis*
Redside dace	*Clinostomus elongatus*
Variegate darter	*Etheostoma variatum*

MAMMALS

Allegheny woodrat	*Neotoma magister*
Badger	*Taxidea taxus*
Bobcat	*Lynx rufus*
Evening bat	*Nycticeius humeralis*
Franklin's ground squirrel	*Spermophilus franklinii*
Gray myotis (FE)	*Myotis grisescens*
Indiana myotis (FE)	*Myotis sodalis*
River otter	*Lontra canadensis*
Southeastern myotis	*Myotis austroriparius*
Swamp rabbit	*Sylvilagus aquaticus*

MOLLUSKS

Clubshell (FE)	*Pleurobema clava*
Eastern fanshell (FE)	*Cyprogenia stegaria*
Fat pocketbook (FE)	*Potamilus capax*
Longsolid	*Fusconaia subrotunda*
Northern riffleshell (FE)	*Epioblasma torulosa rangiana*
Orangefoot pimpleback (FE)	*Plethobasus cooperianus*
Pink mucket (FE)	*Lampsilis abrupta*
Pyramid pigtoe	*Pleurobema rubrum*
Rabbitsfoot	*Quadrula cylindrica cylindrica*
Rough pigtoe (FE)	*Pleurobema plenum*
Sheepnose (FC)	*Plethobasus cyphyus*
Snuffbox	*Epioblasma triquetra*
Tubercled blossom (FE)	*Epioblasma torulosa torulosa*
White catspaw (FE)	*Epioblasma obliquata perobliqua*
White wartyback (FE)	*Plethobasus cicatricosus*

REPTILES

Alligator snapping turtle	*Macrochelys temminckii*
Blanding's turtle	*Emydoidea blandingii*
Butler's garter snake	*Thamnophis butleri*
Copperbelly water snake (FT*)	*Nerodia erythrogaster neglecta*
Cottonmouth	*Agkistrodon piscivorus*
Eastern mud turtle	*Kinosternon subrubrum*
Hieroglyphic river cooter	*Pseudemys concinna*
Kirtland's snake	*Clonophis kirtlandii*
Massasauga (FC)	*Sistrurus catenatus*
Ornate box turtle	*Terrapene ornate*
Scarlet snake	*Cemophora coccinea*
Smooth green snake	*Liochlorophis vernalis*
Southeastern crowned snake	*Tantilla coronata*
Spotted turtle	*Clemmys guttata*
Timber rattlesnake	*Crotalus horridus*
Western mud snake	*Farancia abacura*

* *Northern population only*

Bobcats raise money for WDS

Hoosiers have been given the opportunity to step into the shoes of nongame biologist Scott Johnson and learn to track bobcats. The Track a Bobcat Project, the first of its kind for the WDS, was designed to allow participants to learn about bobcats, how biologists track them and even keep track of a bobcat assigned to them.

Because bobcats are endangered in Indiana, they are closely monitored by the WDS. However, the total cost to the DNR to catch, track and monitor one bobcat is over $5,000 each year.

The project began June 1, 2004 and runs through May 31, 2005. From June 1 to November 30 the project earned nearly $7,000.

There are three participation levels for the project. Participants make a tax-deductible contribution to the Nongame Fund to participate. Once registered with the program, participants will be randomly assigned a bobcat currently being tracked. Registration is permitted through March 1, 2005.

Participants receive coordinates of the last recorded location of their assigned bobcat every two weeks. It is the responsibility of the participant to plot this information on a map and track how far their cat traveled.

Junior Bobcat Biologist

$100
This level is for classrooms, student organizations or educational organizations with approximately 35 students.

Bobcat Tracker

$100
This level is for families or individuals and can be given as a gift.

Bobcat Beacon

$500
This level is for corporations or professional organizations. This level includes the sponsorship of a classroom of the donor's choice.

More information is available online:
www.wildlife.IN.gov
Look for the eagle!

Bobcat Beacons for 2004:

AIRE SERV. HEATING & AIR CONDITIONING
Your COMFORT COMPANY

Mooresville, Ind.

The Herald-Times

Bloomington, Ind.

IMAGING Office Systems, Inc.

Ft. Wayne, Ind.

WDS adds a staff specialist

With the addition of Kacie Ehrenberger to the WDS, we are now full-staffed. Kacie joined the DNR in February 2004 as the WDS staff specialist.

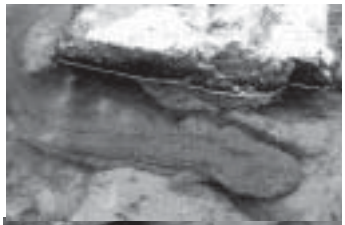
She assists the chief with managing approximately 12 federal grants, coordinating contracts and correspondence with external groups, developing the Indiana Comprehensive Wildlife Strategy and providing administrative support for the section.

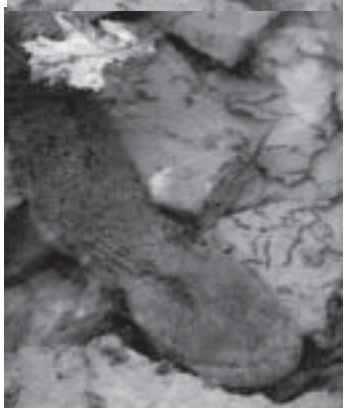
She graduated from Virginia Tech in 1999 with a B.S. in forestry and wildlife. While in college, she studied wildlife management in Kenya, worked as a field technician for salamander research, and worked with the Patuxent Research Refuge in Maryland for the Breeding Bird Survey and the National Wildlife Visitors Center.

Kacie received a masters degree in forestry and wildlife from Purdue University in 2003. She studied the response of breeding amphibians and migrating waterfowl and shorebirds to the wetland restoration at The Nature Conservancy's Kankakee Sands in Newton Co. Before coming to the DNR she worked for Indianapolis Parks where she lead environmental education outreach programs.

Kacie assists with data collection on hellbenders.

Amphibians & Reptiles

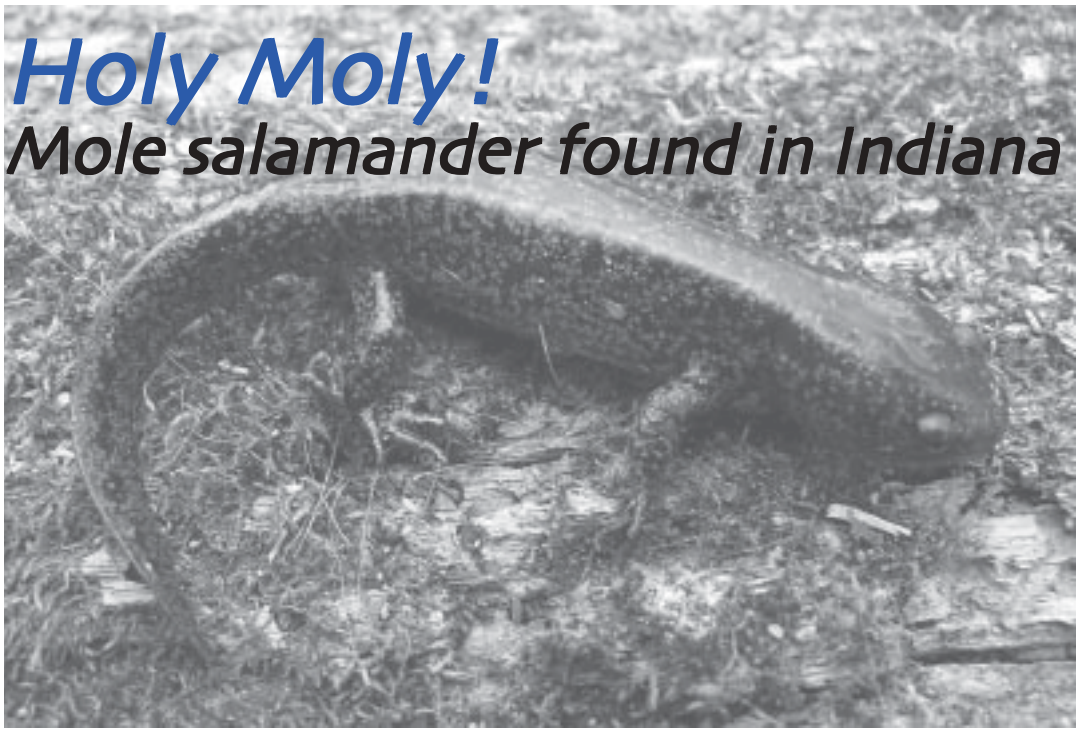




Hellbender studies in the Blue River

The hellbender, a state endangered amphibian, has been studied in the Blue River since 1996. Sampling locations were established in 1998 throughout the length of the river and are being utilized to monitor long-term hellbender population levels. Annual collections have ranged from 15 to 49 hellbenders, with an average of 24 individuals per year. Basic information of weight, length, sex, and location of capture is collected from all captured individuals and each is individually marked for future identification. Several nests have been located during sampling; however, juvenile hellbenders have still not been found. Additional sampling techniques were investigated this past field season in an attempt to locate juveniles and to increase sampling efficiency for adults and will continue to be evaluated.

Holy Moly!
Mole salamander found in Indiana



The mole salamander's presence in Indiana has been speculated by some experts, but never officially documented.

Mole salamanders (*Ambystoma talpoideum*) are short stocky salamanders with a broad head and relatively small eyes. The mole salamander's range is from Virginia south to northern Florida, west to eastern Texas and north to southern Missouri. They typically range from dark blue to brown in color and may exhibit a pattern of lighter whitish to blue flecks along their body.

Isolated populations of mole salamanders can be located in parts of Illinois and Kentucky. However, their presence in Indiana has been speculated by some experts, but never documented. During spring 2004, Purdue University researchers, Rod Williams and Brian MacGowan, discovered a breeding population of mole salamanders in an isolated swamp in Posey Co. This sighting represents a new state record for Indiana. While the origin of the Indiana population is unknown, it is speculated that this is an isolated remnant of an historic population.

Getting their name from their burrowing nature, mole salamanders will emerge in spring from their burrows and migrate to vernal pools or other fishless ponds to breed. These salamanders can lay 200 eggs in small clumps of 20. The eggs will hatch into larvae that can be identified by a bright yellow stripe on their sides. Some mole salamanders retain larval characteristics and remain in breeding pools. After the breeding season, the mole salamander will retreat to underground burrows and feed on invertebrates. It is rare to see this species above the ground.

Preliminary adoption of the mole salamander as a native amphibian to Indiana has been approved. Once adopted, the mole salamander will be protected under Indiana regulations for amphibians and reptiles. Final adoption is expected to occur early 2005.

Purdue researchers, Rod Williams (top) and Brian MacGowan (bottom) discovered a population of mole salamanders in Posey Co.

Herp sampling:
Determining what's in Indiana

In 2004, a monitoring project began on Indiana state properties to determine long-term trends for amphibians and reptiles. The first property chosen for monitoring was Tri-County Fish and Wildlife Area (FWA).

A series of six habitat transects were chosen to monitor herpetological population trends. Each transect consists of 20 paired cover boards spaced 25 meters apart. These boards consisted of 60 wooden and 60 foam boards. Cover boards are boards placed on the ground to mimic a natural log that attracts amphibians and reptiles looking for habitat. All cover boards were placed within suitable habitat and were monitored throughout the summer months.

While sampling for amphibians and reptiles, WDS biologists sampled for specific state endangered species and species of special concern. The focus for 2004 was the spadefoot toad and the hieroglyphic river cooter.

One spadefoot toad chorus was heard during the breeding season in early summer. Eggs and tadpoles were observed at this location. Other breeding choruses were documented in adjacent counties, but were unable to be verified.

Sampling was also performed for the hieroglyphic river cooter along the Ohio and Wabash Rivers. No river cooters were observed during these surveys. However, one sighting was reported for this species in fall 2004. The WDS will implement another long-term amphibian and reptile monitoring study on a second Fish and Wildlife property in 2005.

INAMP Volunteer of the Year Awards

It's the time of the year that the Indiana Amphibian Monitoring Program awards individuals for their dedication and commitment to the program. INAMP awards one or more individuals for their participation with the national North American Amphibian Monitoring Program (NAAMP) and FrogWatch USA.

This year, four individuals are being honored for their achievements. The volunteers receiving the NAAMP award are David Ayer of Rockport, Ind. and Gerald Roach of Charlestown, Ind. Val Frazee of Indianapolis, Ind. and Karen Gotshall of Franklin, Ind. are the recipients of the volunteer of the year award for FrogWatch.

The WDS is thrilled to recognize the individuals who have dedicated the most time to the program. Because the program relies on volunteers, the WDS feels that it is important to recognize those that go above and beyond the minimum requirements for the program.

Both programs utilize volunteers to monitor frog and toad species in their area. NAAMP volunteers are assigned a ten-mile long route which they must drive three times throughout the year. The route is made up of ten sites, or stops, at which the volunteer must stop and record data for the frog and toad species that they hear. FrogWatch volunteers may select a habitat that is suitable for frogs and toads. Volunteers record data on the species they hear as often as they wish and for as many locations as they choose.

Volunteers attend a training session to learn about the 17 native species in Indiana, how to identify them by their breeding call and how to record data for the program. Training occurs one time during the year. Beginning in 2006, the NAAMP will require all volunteers to earn a passing score on a quiz before they are able to participate with the program. More information is available on the WDS website.

Indiana Amphibian Monitoring Program

Data is collected on frogs and toads in Indiana via the Indiana Amphibian Monitoring Program (INAMP). WDS herpetologist, Zack Walker, and Staff Specialist, Kacie Ehrenberger have become the new co-coordinators for the program. INAMP utilizes two, already established, data collection programs. This provides volunteers two options for which they can collect data.

FrogWatch USA is administered by the National Wildlife Federation in conjunction with the U.S. Geological Survey (USGS). The North American Amphibian Monitoring Program is the second option available for volunteers and is administered by the USGS in Patuxent, Md.

For the 2004 breeding season, volunteers recorded a total of 1,855 accounts of frogs and toads. A total of 1,276 were recorded for FrogWatch with an additional 921 for NAAMP. The total number of data collection visits for FrogWatch volunteers was 541 while NAAMP had 70 for a grand total of 611 site visits.

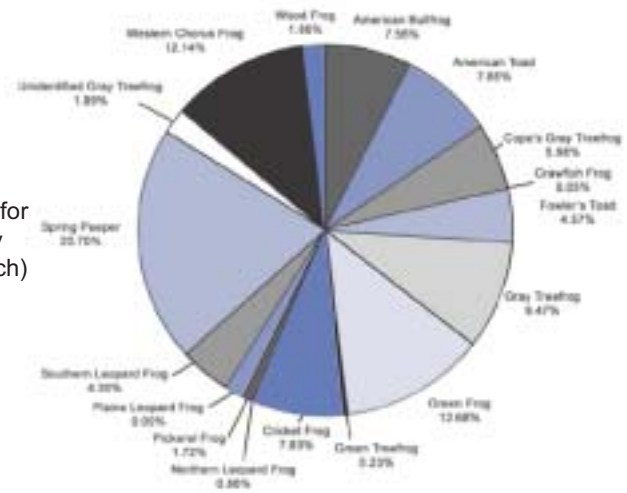
Total number of species accounted for during the 2004 data collection season.

Species	FrogWatch	NAAMP	Accounts
American Bullfrog	103	54	167
American Toad	85	89	174
Cope's Gray Treefrog	64	68	132
Crawfish Frog	1	0	1
Fowler's Toad	63	38	101
Gray Treefrog	114	95	209
Green Frog	184	96	280
Green Treefrog	0	5	5
Northern Cricket Frog	119	56	175
Northern Leopard Frog	18	1	19
Pickerel Frog	28	10	38
Plains Leopard Frog	1	1	2
Southern Leopard Frog	65	30	95
Spring Peeper	259	198	457
Unknown Gray Treefrog Species	1	43	44
Western Chorus Frog	142	126	268
Wood Frog	29	11	41
Total	1276	921	1855

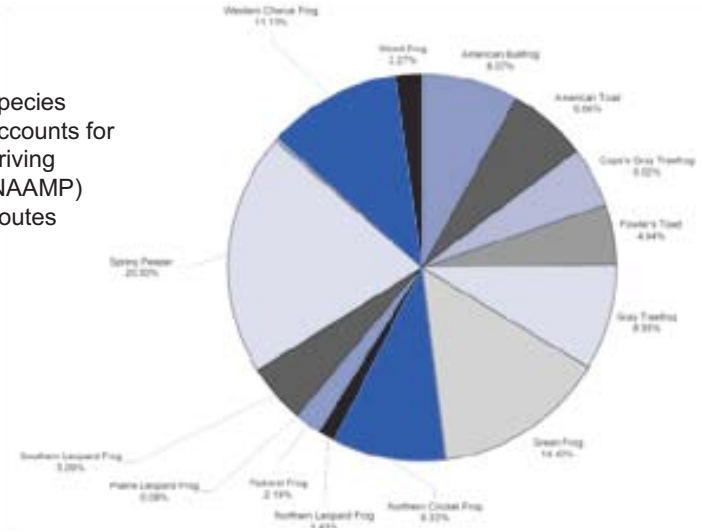
Although the total number of site visits was down slightly from last year, the total number of species accounts was up (see chart next page).

Number of site visits recorded:

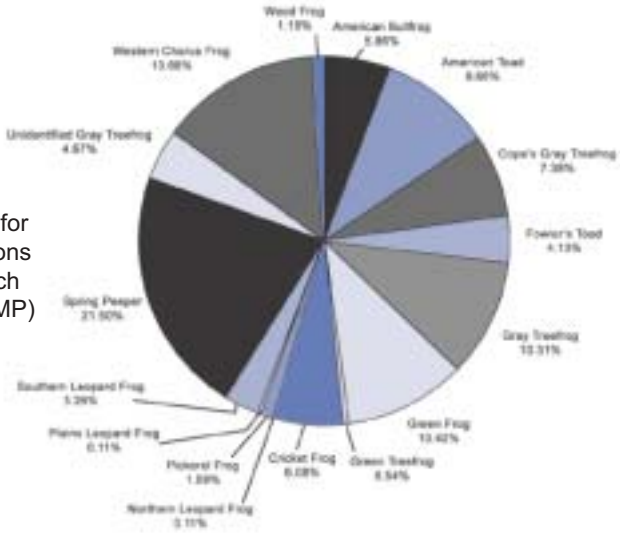
	2003	2004
Frogwatch visits	586	541
NAAMP visits	55	70
Total	**641**	**611**



Species Accounts for Stationary (FrogWatch) Sites

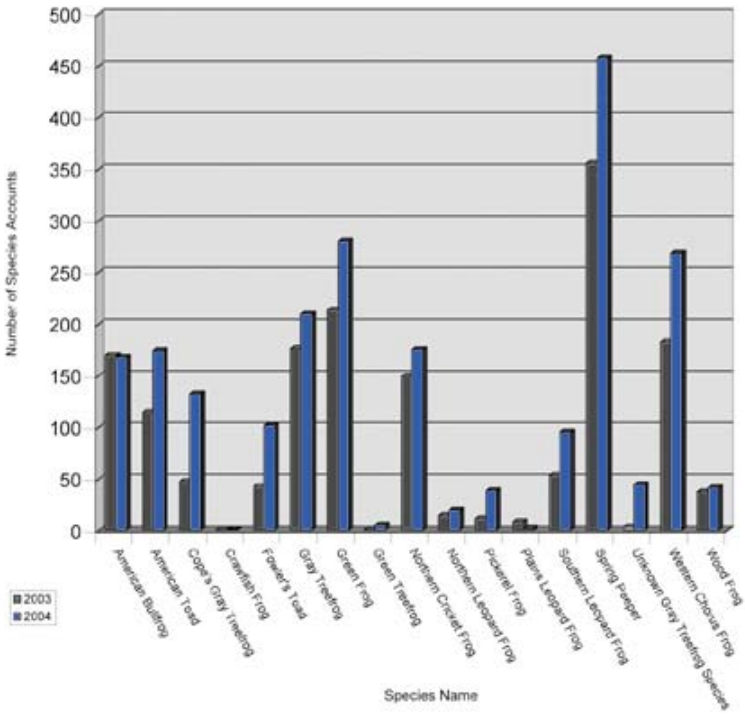


Species Accounts for Driving (NAAMP) Routes



Species Accounts for All Locations (FrogWatch and NAAMP)

2004 Species Accounts Recorded versus 2003.



Volunteer of the Year Awards

Karen Gotshall

Photos of other award winners are not available.

FrogWatch USA

Val Frazee
Indianapolis, Ind.

Karen Gotshall
Franklin, Ind.

NAAMP

David Ayer
Rockport, Ind.

Gerald Roach
Charlestown, Ind.

Common snapping turtles

The common snapping turtle (*Chelydra serpentine*) is listed as a game species in Indiana. Currently, 25 snapping turtles are allowed to be harvested a day with a maximum possession limit of 50. However, little is known about the demographics of this species within the state. In 2004, a snapping turtle survey was initiated to examine the demographics of this species and relate the findings to current management practices.

Turtle traps were placed in Lake Monroe (Monroe Co.) to capture resident snapping turtles. At each trap site, two trapping methods were utilized. Data was collected on each turtle captured before it was released. Data collected includes: carapace length, carapace width, weight and sex. The shell of all captured turtles was marked with a series of small notches for aide in future identification. During 2004, no nests or juveniles were located within the study area. More information on these life history stages is needed for demographic modeling. Demographic modeling examines age classes, sex ratio and reproductive parameters to determine how a population is doing.

Trapped snapping turtles were found to have an even sex ratio of males to females. The average weight of captured turtles was 13 pounds. The largest captured turtle weighed 28 pounds. The average length of captured turtle's carapaces was 10 inches. The largest carapace length was 15 inches.

Six species of turtles were caught within the study area. These species include: painted turtle, red-eared slider, spiny soft shell, musk turtle, map turtle and snapping turtle. Recapture of marked snapping turtles will hopefully provide information on individual growth rates and survival.

Timber rattlesnakes

The timber rattlesnake (*Crotalus horridus*) is listed as an Indiana state endangered species. Timber rattlesnakes may be found in the southern half of the state in dry ridged habitats. Due to their secretive and cryptic nature, relatively little is known about this species within the state. A survey was initiated in spring 2004 to learn more about timber rattlesnake demographics.

Once captured, basic information is collected for each snake. This includes: snout to vent length, total body length, weight, sex and chevron pattern (cross band pattern that runs along the snake's back). Each snake is then implanted with a passive integrated transponder (PIT tag) and the rattle is marked with water-based paint. These markings will aid in future identification.

The average length of the snakes captured during the 2004 survey was approximately 4 feet. The average weight of these snakes is about 3.6 pounds. Only males were captured during the 2004 survey. More information on juvenile and female snakes is needed for determining the population of this species within the state.

Ornate box turtles

The ornate box turtle (*Terrapene ornate*) is considered an Indiana state endangered species. This species of box turtle prefers sand prairies, which typically contain a series of dunes and swales. The majority of ornate box turtle sightings have occurred in the northern portion of Indiana. However, there is a small, sand prairie complex located in southern Indiana where this species has been historically documented. In 2004, WDS attempted to fit an ornate box turtle from the area with a radio transmitter to examine habitat preference and movement patterns. Drift fences (a technique used to lead turtles to trapping areas) and walking surveys were utilized to capture this species. Despite a significant effort, no ornate box turtles were captured in 2004 in southern Indiana as part of this project, thus increasing the concern for the population.

A state endangered species, the ornate box turtle. (Robert Hay)

The eastern box turtle is now protected in Indiana.

Eastern box turtles

The eastern box turtle (*Terrapene carolina*) is the subject of several new legislative rules regarding wild animal collection. In an effort to better understand Indiana's eastern box turtle population, a box turtle survey was implemented in spring 2004.

It will take many years before we fully understand the dynamics of the eastern box turtle population in Indiana. To adequately obtain information about the status of box turtle populations, a study would have to span multiple generations, taking 75 years or longer. This time frame might take into account four generations. Other trends would emerge before this time. However, to thoroughly examine female survivalship and recruitment rates, long-term studies are necessary.

Walking surveys were performed in suitable habitat to locate box turtles. Upon capture, a series of descriptive data was taken on all observed turtles before release. This information includes: measuring the turtle's carapace width, carapace length, weight, sex and relative age. The shells of all captured turtles were marked with a series of small notches to aide in future identification.

No nesting or hatchling turtles were observed within the study site during 2004. Box turtle surveys were performed within two separate habitat complexes. These areas will be compared to one another at the completion of the box turtle survey.

Aquatic Species

Lake sturgeons in the East Fork White River

(left) Because lake sturgeons are bottom feeders, they have an extending mouth to suck up food off the bottom of the river.

(above) Radio transmitters are attached to the dorsal fin on a sturgeon. The transmitter does not hurt the fish.

Over the past eight years, close to 100 different lake sturgeons have been captured using a special gill and trammel net technique over an approximate 40-mile stretch of the East Fork White River in southern Indiana. Captured lake sturgeons have ranged from four to over 100 pounds in weight, although most collected lake sturgeon typically weigh around 30 pounds. Collection of several smaller individuals over the past couple of field seasons indicates that at least some recent reproduction has been occurring.

Several lake sturgeons were fitted with radio transmitters in fall 2002 and have been tracked in an effort to determine movement patterns and to locate potential spawning areas. Similar annual movement patterns have been seen over the two years of tracking. Lake sturgeons showed little movement during the winter months, until the end of March, when all sturgeons made an upstream movement. Most lake sturgeons eventually made it to Williams Dam, with some traveling as far as 40 miles. After spending several weeks in the Williams Dam area, all slowly redistributed back downstream, with most returning to the exact location from where they were originally captured.

Statewide freshwater mussel survey

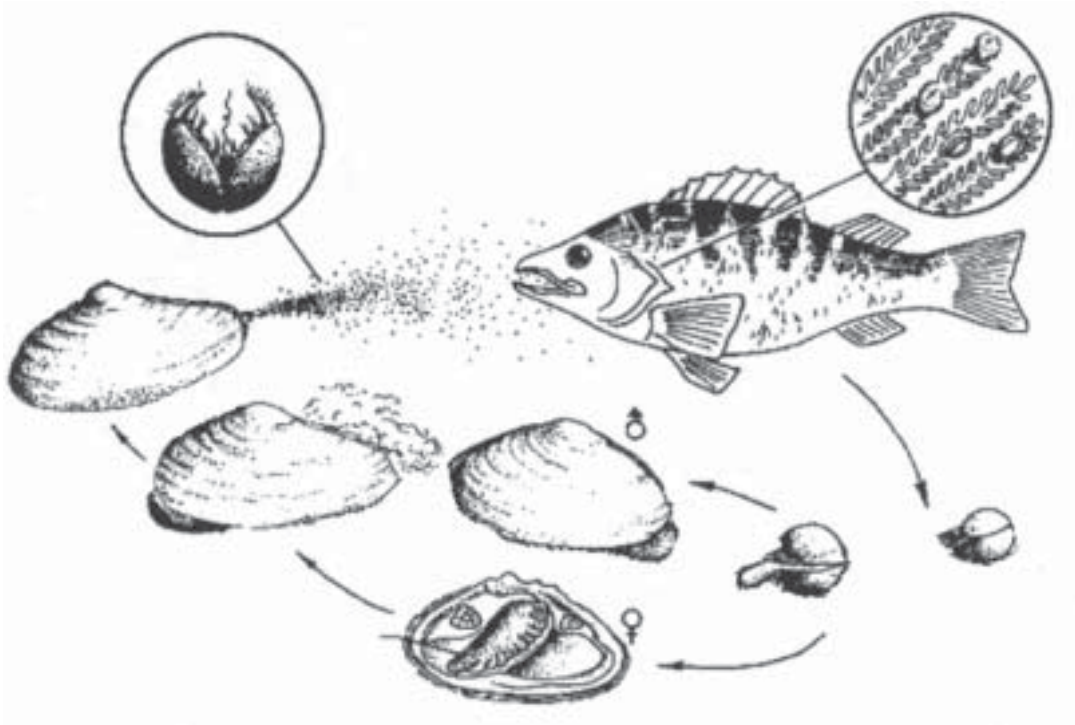
The WDS has funded freshwater mussel surveys of most of Indiana's major drainages since 1990. These surveys have provided valuable information on the current and historical freshwater mussel distribution of Indiana. However, many streams of Indiana have remained unsurveyed; no information is available on their current freshwater mussel community.

A statewide survey of these previously unsurveyed streams was initiated in 2001; nearly 300 sites have been sampled to date. A previously unknown reproducing population of *Obovaria subrotunda* (round hickorynut), a state species of special concern, was located in the West Fork White River drainage. *Villosa lienosa* (little spectaclecase), another special concern species, has been found to have a much larger distribution than previously known. Large, reproducing populations of *Venustaconcha ellipsiformis* (ellipse), also a state species of special concern, were located at several locations in the Kankakee and Lake Michigan drainages. Future surveys will continue to provide important information for many of Indiana's state endangered and special concern freshwater mussel species.

Reevaluation of mussel populations in primary harvest areas

Commercial harvest of freshwater mussels in Indiana was abolished in 1991. To establish baseline population information, a study was conducted between 1992 and 1994 to 1) determine the location, species composition, and relative abundance of mussel beds in the core mussel producing river reaches; 2) evaluate population density, age structure and growth characteristics of commercially valuable and endangered mussel species at representative mussel beds in each river segment; and 3) estimate sustainable yield levels for each commercially valuable species in each river reach.

Results of the first study further supported the continued closure of the commercial mussel harvest. At that time, it was recommended that a similar study be conducted in ten years to reevaluate the status of mussel populations. This reevaluation of the mussel populations in the core mussel-producing river reaches of the East Fork White River, Tippecanoe River and Wabash River was initiated in 2003 and completed this past field season. Results of this survey should be available by spring 2005.



Generalized life cycle of freshwater mussels. Parasitic larval mussels (glochidia) attach to a host and encyst. The host is usually a fish. After a few weeks, the glochidia transform into juveniles and drop from the host. (U.S. Fish & Wildlife Service)

Eastern sand darter is removed from State special concern list

The eastern sand darter (*Ammocrypta pellucida*) historically occurred in the Maumee, Tippecanoe, West Fork White, East Fork White, Wabash and Whitewater drainages of Indiana. During a statewide fish survey in the 1940s, the eastern sand darter was collected from 34 locations across the state. Since that time, sporadic collections of the eastern sand darter have continued, although many have speculated that its distribution and abundance is declining. Its decline has been attributed to the destruction of its desired clean, sandy run-habitats through siltation and dam construction.

A systematic, statewide survey for the eastern sand darter was initiated in 2001. Results indicate that eastern sand darter distribution seems to be even more widespread than known historically. Previously unknown populations were found in Richland Creek (Greene Co.), Clifty Creek (Bartholomew Co.) and Sand Creek (Bartholomew/ Jennings Co.). Eastern sand darters were also collected in several stream systems where they had not been recorded for over a century: Big Raccoon Creek, Deer Creek, St. Mary's River and Maumee River.

As a result of this survey, and by recommendation of the Fish Technical Advisory Committee, the eastern sand darter has been taken off Indiana's list of special concern species.

Bird Species

Survey and management of interior least terns

Least terns have nested at Gibson Lake since 1986 and at least 25 pairs have been noted each year since 1996. Pairs also nested in Spencer Co. in 2003 but did not do so in 2004 although up to 6 individuals were present. At Cinergy's Gibson Station, record numbers (84) of nests were found, most along the gravel dike bisecting Gibson Lake. This high number is deceptive in that only 90 adults were present, so it represents a high renesting rate after earlier failures. Predation and abandonment were the primary causes of nest failure on the dike with ring-billed gulls being the primary predator implicated.

Flooding caused nest losses at an ash disposal area. In spite of intensive efforts to control gulls on the center dike, only 13 chicks fledged (4 on the dike). Eggs hatched at 26 percent (a record low) of nests, partly due to disturbance from more intensive monitoring this year. Purdue University researchers again used cameras (still and video) to document success of selected nests. The center dike appears to be a population sink, so successful nesting by least terns will depend on the birds using other areas with fewer predators. In this regard, construction of tern nesting islands at the Cane Ridge (part of Patoka National Wildlife Refuge) adjacent to Gibson Lake began in September 2004 and should be available in 2005. Planning occurred at nearby Tern Bar Slough Wildlife Diversity Area to construct additional nesting sites.

Tern-bar slough construction

The WDS continues to work with NRCS and the U.S. Fish and Wildlife Service to prepare the habitat for construction of a new tern-bar nesting habitat in Gibson Co. Construction is scheduled to begin spring 2005.

Here are some photos of the pre-construction habitat. There is a lot of work yet to be done!

(top) The construction of the slough is in proximity to a Cinergy power plant. (bottom) The property was an old farm site that required cleaning.

population sink...

A population sink is an area attractive to breeding birds where reproductive success is below that which is needed to sustain the population.

Peregrine falcon nesting report

Already-banded peregrine chicks sit on the edge of their nest box. Peregrine chicks do not begin to fly until they are nine to 12 weeks old.

Although 11 nesting attempts were again documented this year, these included two new sites, both along Lake Michigan. No nesting took place at two previously used sites in Indianapolis and Kokomo where nest boxes had to be relocated.

During 2004, falcon pairs were located at seven industrial sites (steel mills, power plants, highway bridge, oil refinery) along Lake Michigan, a power plant in Jasper County (30 miles south of Lake Michigan), and at inland urban areas on buildings (Indianapolis, Fort Wayne, South Bend). One existing pair selected a new nest site, one mile from the previous year's location. All but four nesting adults were identified and no turnover was noticed.

At a bridge site in East Chicago, nests were within 1/4 mile of each other and the identified male appears to be associated with both females. Ten of 11 nesting attempts were successful, and 30 chicks fledged with all but three chicks banded. Four instances of post-fledging mortality were noted and two injured birds are undergoing rehabilitation. During 2004, ten peregrines with Indiana origins were known to be nesting in Indiana (3), Wisconsin (3), Michigan (2), Illinois (1) and Ohio (1). A new nest box was built at a power plant near Petersburg.

Indiana Peregrine Falcon Nesting

	Nesting Attempts	Successful Nests	Young Fledged
1989	1	1	3
1990	2	2	3
1991	2	2	3
1992	2	2	6
1993	2	2	6
1994	2	2	8
1995	3	3	8
1996	7	6	16
1997	7	6	15
1998	8	7	15
1999	8	7	24
2000	8	8	23
2001	9	9	20
2002	10	9	27
2003	11	9	33
2004	11	10	30

Crane management

During the coordinated fall census on Oct. 30 and 31, 2003, approximately 15,262 sandhill cranes were counted at Jasper-Pulaski FWA, along with 450 at Pigeon River FWA and ten at Kingsbury FWA. The peak fall population of staging sandhill cranes at Jasper-Pulaski was 24,619 on December 18. Four of the 20 whooping cranes in the introduced eastern population made stops at Jasper-Pulaski.

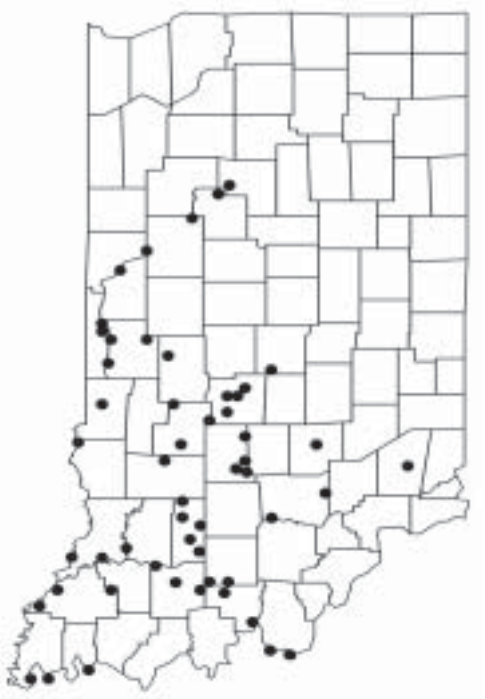
During the third year of the Eastern Whooping Crane Program, 16 captive-bred whooping cranes were lead by ultralight aircraft on Oct. 16, 2003 from Necedah National Wildlife Refuge in central Wisconsin and arrived Dec. 8 at the wintering site at Chassahowitzka National Wildlife Refuge on the Gulf Coast of Florida. The 23 days of flight was similar to previous years, but weather delays increased the overall migration period. The Indiana leg of the project lasted from Oct. 27 through Nov. 8 with cranes making stops in Benton, Boone, Morgan and Jennings counties. The 18 surviving and trackable birds from previous releases migrated from Wisconsin to Florida from Nov. 7 to Dec. 2. Fall migration was completed in 5 to 23 days with four to eight days of actual flight. Nine (in three groups) members of the 2001 and 2002 cohorts were detected in Indiana during spring migration from March 22 to 29.

Hoosier bald eagles

Nearly all production records were broken this year in Indiana with 44 of 50 active nests successfully producing 85 young (1.7 eaglets fledged/active nest). Overall, 61 nest structures or territories were known and monitored in 29 counties. Nine nests were active for the first time and four active pairs from 2003 did not nest this year. The overall breeding range remained similar to last year with all new nests discovered within the existing range. Single eaglets were raised at 13 nests, twins at 21 nests, and triplets in 10 nests. A summer storm with high winds destroyed or damaged several nests after all young had fledged.

The Nongame Bird Technical Advisory Committee will propose de-listing this species in Indiana if numbers exceed 50 pairs in the next few years. On the Midwinter Eagle Survey in January 2005, the 124 bald eagles tallied were below the 10-year average of 156 and the lowest number since 1999. Weather conditions were again mild prior to the survey allowing birds to remain farther north. Waterways were ice-free resulting in an above average concentration on lakes and reservoirs (39 percent versus the 10-year mean of 32 percent) compared to rivers. Most (62 percent) of the eagles observed were adults.

2004
Active Bald Eagle Nests



(top left) From left, Avian & Exotic Animal Clinic Inc. veterinarian, Angela Lennox, and her assistant, Carol Barnett, give the ospreys a clean bill of health.
(top right) Although juvenile ospreys look like adults, they are unable to fly.
(bottom) Along with adult-size bodies come, adult-sized talons.

Oh, my! Ospreys!

Releases were again made at Patoka Lake and Tri-County Fish and Wildlife Area with new releases at Jasper-Pulaski and Minnehaha FWA. A total of 32 osprey nestlings was obtained from the Chesapeake Bay of Virginia and transported to Indiana on June 10 and 24. All ospreys except one (died of an eating-related disorder) were released between June 22 and July 21. Fish were provided at hack sites until August 22 to Sept. 4.

Dispersal usually occurred 4 to 5 weeks after release. Two birds were noted during dispersal away from release areas. An osprey last seen at Jasper-Pulaski on August 3 was found injured near Peoria, Ill. on August 5 and later died. A color-marked osprey (Indiana hack site undetermined) was observed north of Indianapolis on Sept. 11. Eight active nests (Brookville Reservoir, two at Potato Creek State Park, Patoka Lake and Hovey Lake Fish and Wildlife Area) were known in 2004 and 16 nestlings were successfully raised at six of the nests. Additional pairs were also observed at Pigeon River Fish and Wildlife Area and Patoka Lake. Hack site attendants were: Aaron Holbrook, Seth Pearson, Sheila Bobay, Chris Bobay, Lisa Christie, Sara Carrow, Adam Reimer, Eugene Brown, Chris Rea, Cheryl Fisher, Jason Wampler, Adam Grossman and Cade Mills.

Mammal Species

River otters on the move

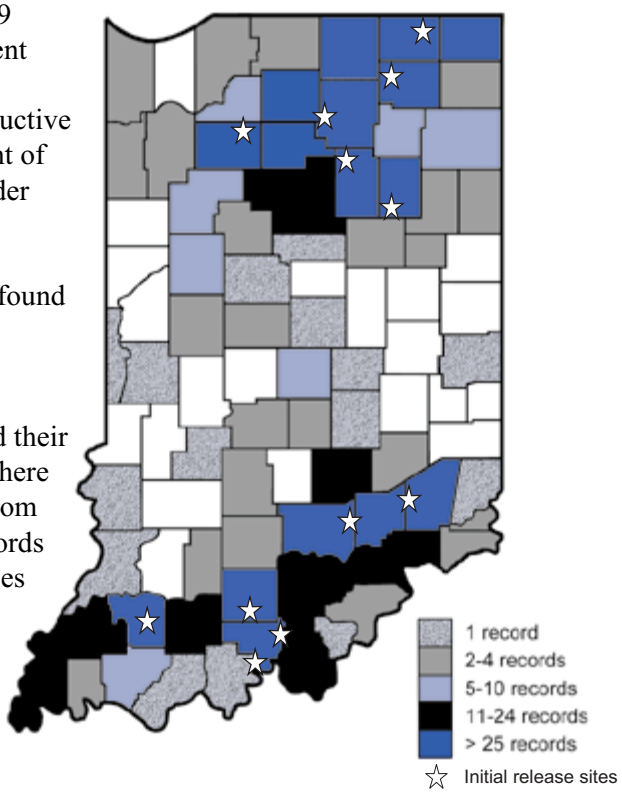
The Indiana River Otter Restoration Program was created with a goal of restoring otter populations in six watersheds in the state. From 1995 to 1999, 303 otters (184 males, 119 females) obtained from Louisiana were released at 12 sites in northern and southern Indiana. To date, 58 (42 males, 16 females) of these animals (19 percent) are known to have died. Incidental trapping (n = 29) and road-kills (n = 18) have accounted for 81 percent of the known mortalities.

Field surveys, observations and information obtained from recovered individuals are used to monitor the post-release status, distribution and range expansion of river otters in Indiana. Standardized bridge/stream surveys were initiated in 2000 to obtain information regarding Indiana's otter population. Twenty-two counties were sampled during the 2003-2004 winter, but otter sign was detected on six routes (27 percent) at only 9 of 467 points (1.9 percent) visited. Last winter was again dominated by mild conditions that restricted ice and snow cover throughout most of the state. The survey design is being revised for the 2004-2005 winter to maximize opportunities for detecting otter sign on rivers and streams throughout Indiana.

Between Sept. 1, 2003 and Aug. 31, 2004, 48 river otters (19 males, 27 females, 2 unknown) were reported killed in Indiana, this includes a record number of otters accidentally taken during the fur harvest season. Distribution by age class of 110 non-marked otters killed in Indiana since 1994 is 24 percent juveniles, 29 percent yearlings, and 47 percent adults (2 years or older). Preliminary analyses of reproductive tracts indicate nearly 80 percent of females two years of age or older exhibit signs of breeding. Surprisingly, evidence of reproductive activity was also found in 56 percent of the yearling females.

River otters continue to expand their range throughout the state, as there are now post-release records from 70 Indiana counties. Most records (90 percent) occur in 23 counties surrounding the 12 release sites, which supports the belief otters are reestablished in those watersheds targeted for restoration. However, otters have also colonized other portions of the state such as the Kankakee River, East and West Forks of the White River and Whitewater River drainages.

Post-Release Otter Records Oct. 2004



Bobcat studies in Indiana

Ecological studies:

From mid-November 2003 to early April 2004, nongame personnel captured ten bobcats (7 males, 3 females) 11 times in 2,488 trap-nights during the sixth field season of a multi-year study to investigate resident bobcat populations in southcentral Indiana. Four cats (3 males, 1 female) were previously radioed adults and were outfitted with new transmitters. Six new bobcats (4 males, 2 females) were captured including two subadult males and a subadult female. Each radioed cat was generally located three times weekly through August 2004 to obtain information on survival, home range and movement patterns.

Since the project began in 1998, 36 bobcats (22 males, 14 females) have been captured 78 times in 14,670 trap-nights. Thirty-one cats (20 males, 11 females) have been radioed and monitored for an average of 1 1/2 years (range: 2 months – 4 1/2 years). Eleven radioed bobcats (7 males, 4 females) are known to have died during the study, seven of which were caused by collisions with vehicles.

Preliminary results suggest a high annual survival rate (83 percent), particularly for established resident adults. Five of 12 subadult cats (41 percent) are known to have died during dispersal. Maximum distance traveled by eight dispersing males has averaged over 83 miles. In contrast, dispersal distances of four subadult

females have ranged from 2 to 14 miles (average distance is 6.1 miles). Home range analyses are ongoing; those that have been summarized to date indicate the annual home range size of a resident adult male averages about 30 square miles while that of an adult female averages only 16 square miles. The final trapping season will begin in November 2004 while monitoring of radioed cats is scheduled to conclude in spring 2006.

Bobcat report database:

Bobcats have been listed as a state-endangered species since 1970, but Indiana's bobcat population appears to have increased sharply in recent years. Excluding individuals captured or sighted as part of the telemetry study, there have been 75 confirmed reports of bobcats from 29 Indiana counties since 1970. Fifty-seven reports (76 percent) have occurred in the last seven years. Most are in the southwest and southcentral sections of Indiana with fewer reports scattered throughout the southeast, westcentral, northcentral, and northeast regions of the state. Leading counties include Posey (14), Pike (6), Greene (5),

Bobcats are typically three to four times larger than the average house cat.

Lawrence (5), Martin (5) and Warrick (5). Recent confirmed reports include single road-kills in Cass, Dubois, Jefferson, Marion, Switzerland and Vanderburgh counties, three road-kills in Posey County, and an accidental capture along Crooked Creek in Steuben County. The database currently contains information on 284 reports of bobcats in Indiana.

Management of Indiana bat hibernacula

WDS biologists use various strategies to manage important Indiana bat winter hibernacula and assess the efficacy of different protection measures. *"Indiana Bat Hibernating Colony"* warning signs, which define the seasonal closure period from Sept. 1 to April 30, are posted at 11 caves in southern Indiana. Remote electronic alarm systems, first used in 1996, continue to be effective deterrents to unauthorized visitations in three monitored hibernacula. The 2003-2004 winter was the eighth consecutive hibernating season in which no visitations were noted in Grotto Cave. No visitations were detected in Coon Cave for seven out of the last eight winters. Ray's and Saltpeter caves both experienced relatively low levels of unauthorized visitation (1-2 trips to each cave), a slight decline from the previous winter. Other management activities include landowner outreach, sign maintenance and use of dataloggers to monitor roost temperatures in select hibernacula.

Indiana bats hibernate in several caves in Indiana. During summer months however, they can be found roosting under loose bark of dead trees and Shagbark Hickory trees.

WDS biologists study too:

Timber rattlesnakes

Foraging behavior of timber rattlesnakes in the wild is poorly understood. Available information consists mostly of anecdotal observations. However, researchers are beginning to better understand the foraging behavior of timber rattlesnakes.

Rulon Clark, of Cornell University, devised a method to record timber rattlesnakes while they forage. Night vision cameras film timber rattlesnakes throughout the day while they lie in wait for their next meal. Interactions between predator and prey can now be recorded and analyzed.

During his study, Rulon noted an interesting bit of information. If a rattlesnake is unsuccessful in striking its prey, it appears that some birds and mammals turn upon the unlucky snake. Squirrels have been shown to enter into a harassment display. The squirrel will dash toward the snake, run up and down trees and generally taunt the would-be predator. This display is typically repeated until the snake moves to another area. It is thought that these actions discourage the snake, and inform other prey items to stay clear of the snake's menace. The timber rattlesnake relies on its cryptic nature. When pointed out to the world, these snakes prefer to move on.

Presented at the Biology of the Rattlesnake Symposium, Loma Linda University, 2005.

Naturalist aides assist WDS staff

(*From left)* Cassie Hudson, Heather Walker, John Castrale and Aaron Holbrook work together to band an adult peregrine falcon.

Every year, WDS biologists put in hundreds of hours collecting and processing data. There are four nongame biologists that must cover the entire state of Indiana. But thankfully they don't do it alone!

Part-time naturalist aides work side-by-side with our biologists to collect data, manage, and conserve Indiana's nongame and endangered wildlife.

WDS naturalist aides took a few moments out of their busy schedules to tell us a little more about themselves.

Nate Engbrecht

Best day on the job:

When I went looking for mole salamanders. Not only did we find mole salamanders, but we also came across other salamander species, including one of my personal favorites, the marbled salamander. It was probably the best salamander hunt of my life.

Worst day on the job:

One of the low points of the job that I recall was when we were looking for snakes in this mosquito infested bottomland in Southern Indiana. I was getting frustrated and wasn't very happy with the situation. The up side is that we ended up finding some of the snakes that we were looking for.

Hometown:

I was born in Lincoln, Neb. I grew up in Bremen, Ind. and I currently live in the Bloomington, Ind. area.

Education:

I graduated from Bethel College in Mishawaka Ind. with a BA in Environmental Biology and Communication. I then worked at Purdue University's Department of Forestry and Natural Resources.

Ted Briggs assists the WDS aquatics biologist with tracking lake sturgeon.

Nate Engbrecht helps with hellbender research.

Aaron Holbrook assists with banding state-endangered peregrine falcon chicks.

Aaron Holbrook

Best day on the job:
Getting hit in the head by a Peregrine falcon for the first time.

Worst day on the job:
Getting hit in the head by a 2X8 that fell off an osprey hack tower.

Hometown:
I am originally from Pikes Peak, Ind., close to Gnawbone and Stonehead. I currently live in Bedford.

Education:
I have a BS in Biology from Ball State. I have been working with the DNR since 1998. I have worked for the Division of Forestry, Nature Preserves, State Parks, and now Fish & Wildlife. I have been with the WDS since March 2002.

Seth Pearson helps to install a nest box for a barn owl. Barn owls are endangered in Indiana.

Ted Briggs

Best day on the job:
Whenever the last day was that I worked in the field.

Worst day on the job:
Any day that I have to enter data into the computer.

Hometown:
I am originally from southern Marion Co., but now live in Bargersville, Ind.

Education:
I have a BA in business from Indiana University.

"We don't accomplish anything in this world alone...."

-Sandra Day O'Conner

Cassie Hudson holds a sedated bobcat in preparation for collecting data.

Cassie Hudson

Best day on the job:
One of my best days was seeing bobcat 30F with three of her kittens. I inadvertently parked my truck directly over a culvert. Cat 30F and her kittens meandered down the drainage, coming straight at me. They continued through the culvert popping out the other side: mom, followed by the three kittens!

Worst day on the job:
No one in particular stands out. Don't get me wrong, there are plenty of days that have their moments; like searching for a cat for 6 hours straight hearing nothing but static in the headphones.

Hometown:
I grew up on a farm in Adams Co., just outside of Decatur, Ind. I currently live in Bloomington, Ind.

Education:
I attended Indiana University where I received my B.S. from the School of Public and Environmental Affairs.

Seth Pearson

Best day on the job:

While working on the Osprey restoration project. They were finally mature enough to take flight and the doors were opened. I was watching one of the birds fly from one perch to another inside the box all morning. He misjudged the distance to the edge of the door, causing him to take his first flight. He flew into the cove and he landed on a snag in the water.

Worst day on the job:

That would of been cleaning out barn owl boxes in late summer and having all the regurgitated rodent hair and bones stuck on my sweaty skin, on my clothes and even in my pockets by the end of the day.

Hometown:

I grew up in Anderson, IN. While with the DNR I was living in Jasper IN and now I am working for the winter in Hollywood, Ark.

Education:

BS from Purdue University in Biology with a specialization in Ecology, Evolution and Population Biology.

Once sedated, the bobcat is moved by Ryan Walker to prepare for data collection.

Heather Walker

Best day on the job:

Any bobcat sighting is always an unexpected treat. This particular sighting was especially memorable because I had not yet seen a bobcat up close. I was searching for a radioed bobcat, when I came around a bend and saw a bobcat kitten in the road. I turned off my truck and sat to watch. A second kitten appeared. Then, the female bobcat joined her two kittens. Finally, the third kitten came running and they all crept off.

Worst day on the job:

The hardest day was probably the longest also. We had spent all day setting woodrat traps in Harrison Crawford State Forest at the end of a dead-end county road. Hot and tired we started for home. As we came around the corner, the road was gone! County workers had removed the culvert while we were setting traps. After walking five miles in the rain at dusk, we got some help and made it home. We finally got our trucks back about a week later.

Hometown:

I am a Native Hoosier. I grew up close to Monrovia, Ind. I currently live in Bloomington, Ind.

Education:

I received my BS from Purdue University in Wildlife Science.

Heather Walker is all smiles while helping to collect data on this sedated bobcat.

Ryan Walker

Best day on the job:

My best day would be any day that we successfully capture a bobcat. It's great to finally see what we have been tracking for so long! The opportunity to have a close encounter with such an elusive species is an experience I will never forget.

Worst day on the job:

I had just finished helping with a herp. survey, and on the ride home I noticed an itchy feeling all over. Later, while sitting down for lunch, I realized I was covered from head to toe by hundreds of seed ticks! Thank God for duct-tape!

Hometown:

I was born and raised in Bloomington, Ind. and currently live there.

Education:

I graduated from Purdue University with a BS in Natural Resources and Environmental Science.

Burning the midnight oil

Katie Smith, WDS Chief

Kacie Ehrenberger, Staff Specialist

Alisha Schiffli, Education Specialist

Meet the WDS Staff. This year the staff got out their pens and put on their thinking caps to write up creative descriptions about their jobs.

The Chief

Cherished are sedge wrens, slimy sculpins and star-nosed moles, for they are worth retaining.

Lucky are the neighbors of hellbenders, rails and pearlymussels, for they are enriched.

Determined are those who strive on behalf of least weasels, least darters and least terns; they see no future without them.

Overwhelmed are the advocates for bitterns, dace and frogs, for they must make their voices heard above the maelstrom.

Hopeful are the partners for cranes, sturgeons and rattlesnakes, for they do not strive alone.

Grateful is the one that works with Alisha, Brant, John, Kacie, Scott and Zack for they are lucky, determined, overwhelmed and hopeful and all in it together.

Diversity is good.

-- Katie Smith

Staff Specialist

Grants, bills, contracts and more
Some biologists would find these a chore.

But I enjoy learning how things are run
I'm finding this part of conservation is really fun.

Aiding the biologists and assisting the chief,
There are so many "odds and ends" jobs, and none of them are brief.

Planning for the Section fills my days.
Managing over 800 species is challenging in so many ways.

I'll try to keep the field biologists outside
So occasionally they will take me along for a ride!

-- Kacie Ehrenberger

Education Specialist

Creating, writing, designing, printing, mailing, talking and teaching.

Mailboxes overflowing with inquiries each day.
Talking to reporters and telling them what to say.

PageMaker and Photoshop are my tools of the trade.
Brochures, handouts and posters have to be made.

Encouraging people to contribute on tax forms.
New fundraising ideas require frequent brainstorms.

Hoosier animals is the topic of it all.
Educating others about them is definitely a ball.

All in a days work for someone in PR.

-- Alisha Schiffli

John Castrale, Ornithologist

The Ornithologist

From a roadside edge in
the summer dawn,
straining to detect the
flycatcher's song;

On rooftop, catwalk, and
building ledge,
tagging young falcons
before they fledge;

In a rotored craft above the
river bend,
tallying nests mama eagles
tend;

With binoculars, laptop, and
other toys;
These are some things the
bird guy enjoys.

-- John Castrale

Brant Fisher, Aquatics biologist

An Aquatics Biologist

A day in the field sampling for
treasures,
avoiding the office is always a
pleasure

Wading Hoosier rivers, and
tromping along beaches,
attracting mosquitoes,
slapping deer flies and
pinching off leeches

Netting sturgeon, toe-picking
mussels and shocking up
fishes,
hoping we find only our wishes

Pirate perch, washboard,
threeridge,
artificial limbs, old living room
set, refrig'

Pimpleback, gravel chub,
Wabash pigtoe,
stolen purses, rusting car
parts, commode

Wavyrayed lampmussel,
sculpin, purple wartyback,
rotting deer carcasses,
dentures, unknown things in a
sack

These are a few of our favorite
things to date,
its anyone's guess to what
hidden riches await.

-- Brant Fisher and Ted Briggs

Scott Johnson, Mammalogist

The Mammalogist

This job requires many
hats,
Like trapping cats or cliff-
dwelling rats.

Caving in the winter to
count the bats,

And best of all, searching
for otter scats.

-- Scott Johnson

Zack Walker, Herpetologist

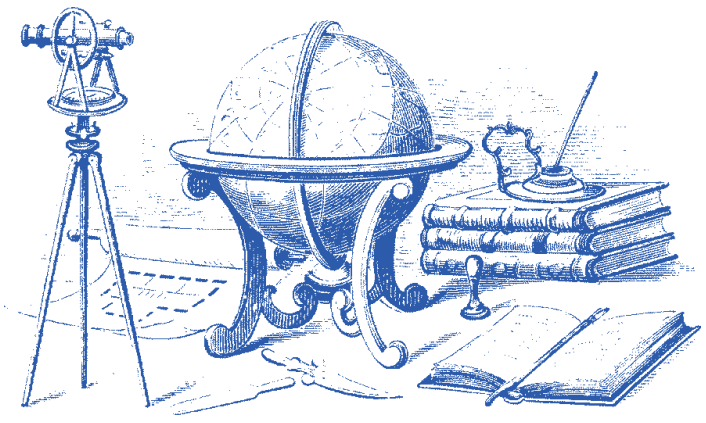
The Herpetologist

There once was a biologist
named Zack,
who everyone thought was
a quack.

He preferred all the snakes
not to be beaten by rakes.

Because herps are best
when not dead on their
backs.

-- Zack Walker



Supporting Indiana's wildlife

The WDS would like to thank these individuals and organizations who have made significant contributions to the Indiana Nongame Fund.

Bart and Cinda Culver
North Webster, Ind.

Bart's Water Sports
North Webster, Ind.

Cinergy, PSI

D.J. Case and Associates
Mishawaka, Ind.

Frenzel Family Charitable Trust

Indiana State University - Dept. of Geography, Geology and Anthropology
Terre Haute, Ind.

Indiana State University - Dept. of Life Sciences
Terre Haute, Ind.

IPALCO

Kosciusko Co. Soil and Water Conservation District
Warsaw, Ind.

Medtronic Sofamor Danek
Warsaw, Ind.

Midwest Biodiversity Institute
Columbus, Ohio

NIPSCO

Pheasants Forever
Marshall Co., Ind.

Purdue University - Dept. of Forestry and Natural Resources
West Lafayette, Ind.

Sam's Club
86th St. Indianapolis

How you can help!

Contributions to the Indiana Nongame Fund have brought ospreys and bald eagles back to our skies and otters to our waters. The programs discussed in this report as well as many other restoration, management and educational projects implemented by the WDS rely on contributions from individuals like yourself.

You may donate all or a portion of your tax refund on Line 32 of your IT-40 form, complete the form on the back of your tax booklet or complete the form below.

I (We) wish to donate $ _____ to the Indiana Nongame Wildlife Fund.

Name(s)		
Address		
City	State	Zip Code
E-mail address (optional)		

Mail your contribution and this form to:
Indiana Nongame Fund, Division of Fish and Wildlife, 402 W. Washington St., W273, Indianapolis, IN 46204

Look for the eagle!

Wildlife Diversity Section
Division of Fish & Wildlife
402 W. Washington St., W273
Indianapolis, IN 46204
(317) 232 - 4080

www.wildlife.IN.gov